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FROM EXCESS STIMULUS TO MONETARY MAYHEM

Kevin Dowd and Martin Hutchinson

Three hundred years ago, the Scottish financier John Law embarked on an interesting monetary experiment in France that foreshadowed recent central bank policies. It included money creation, quantitative easing (QE), debt monetization, low interest rates and audacious financial engineering. It worked for a while but then collapsed. Large numbers of people were ruined, and Law fled the country in disgrace.

Law's mistake was to think that he could manufacture prosperity by printing money. In the aftermath, difficult lessons were learned about the dangers of the uncontrolled issue of paper currency and of responding to short-term economic problems with wild monetary experiments. France reverted to a metallic monetary system and the resulting horror of paper currency and banks lasted a long time. Those hard-won lessons were then forgotten. In the 1790s, France embraced the Assignats with the same enthusiasm as she had earlier embraced Law, and the result was another disaster. Similar episodes recurred throughout the 19th century and prompted Sir Robert Giffen (1892: 465) to observe:

For a good money is so very difficult a thing to get, and
Governments, when they meddle with money, are so apt to

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make blunders (and have, in fact, made such blunders without end in the past, of which we have had so many illustrations lately in the experience of the United States, the Argentine Republic, Russia, and other countries), that a nation, which has a good money should beware of its being tampered with, and especially should beware of any change in the foundation—the standard for money.

Forward to recent years and we have unlearned those lessons again. Modern monetary policymakers are prone to make several major intellectual errors. The first is their fixation with the belief that if there is, or appears to be, inadequate macroeconomic performance, then that must be due to inadequate aggregate demand and their only solution is to stimulate demand. Such thinking is reminiscent of the man with a hammer, to whom every problem looks like a nail. Other diagnoses and solutions—such as the need to address structural problems in the banking system and to address labor market, tax and regulatory reform, and fiscal sustainability—are swept under the carpet. Fundamental problems then remain unresolved, and Keynesian policymakers are left wondering why their policies are not working as they expected.

Their second intellectual error is deeper and might be described as instrumentalism. Instead of seeing the monetary system as a spontaneous social order whose sole purpose is to serve its participants as they go about their business, it sees the monetary system as something to be controlled for some allegedly higher end. So the interest rate and the supply of money are not seen as the products of markets but as control instruments to be determined by some central authority. Analysis of the monetary system as a self-organizing social order gives way to control and optimization analysis—that is, how best to manipulate these “instruments” to achieve some arbitrary central bank objective. In Herbert Frankel’s words, there is

the belief that a free monetary order is irrelevant and has now become an anachronism, a relic of the past, and an impediment to the allegedly more “rational” policies of the present: the free monetary order should be abolished wherever it has not already been abolished. . . . It is surely significant that currently—even in the free world—the notion that people are entitled to use money as they please, is regarded with considerable scepticism [Frankel 1977: 4, 14].

From this perspective, more instruments are always to be preferred to fewer, and the inbuilt constraints that protect a free monetary order—such as constraints against the overissue of money—are merely hindrances that prevent central banks from achieving their objectives, that is, doing as they please. Underlying this error are deeper ontological ones: they assume that they understand the economy and presume to think that, if they understand it, then they can control it (W. R. White 2015). Unfortunately, they don't understand how the economy works, and they don't know how to control it.

The Establishment of the Fed and the Managed Monetary System

Before the Fed, prices, interest rates, and monetary aggregates were constrained by the gold standard. Banks issued currency convertible to gold at a fixed price, monetary aggregates were largely determined by the public demand to hold money, and interest rates were determined by supply and demand in financial markets—all subject to the rules of the gold standard. There was no monetary policy and no central bank to operate one. Once the Fed was established, however, it began to manage the system and, in so doing, to undermine it. As Ralph Benko (2016) has observed, “Congress delegated weights and measures to the National Institute of Standards and Technology, which is doing a stunningly great job of it. Congress delegated the power to regulate the value of the dollar to the Fed, which is making a botch of it.”

To illustrate, according to official BLS CPI data, the U.S. dollar had lost 83.2 percent of its 1914 purchasing power by the time the last vestiges of the discipline of the gold standard were abandoned in 1971. Since then, thanks to the Fed, its purchasing power has fallen by 95.8 percent relative to its 1914 purchasing power.

Under the classical gold standard, interest rates were bounded by the rate of time preference and the expected return on capital: if they fell below the former, no one would lend, and if they went above the latter, few would borrow. Interest rates were also highly stable during the gold standard: government bond yields were

generally between 2 percent and 4 percent.¹ Over time, however, the Fed acquired more control over interest rates—the most important prices in a market economy—and for the last 45 years they have been entirely determined by the whims of a committee, the FOMC, and have been far more volatile. The Fed’s control over interest rates led to wild swings as the Fed lurched from monetary excess to restraint and back again, creating one boom-bust cycle after another.

The Fed’s Serial Bubble Machine

Forward to 1996, and Alan Greenspan famously warned of “irrational exuberance” in the stock markets before easing monetary policy to stimulate them further. The “Greenspan put” protected investors on the downside, encouraging them to buy more stocks and push up their prices. This policy was justified by the belief that boosting the markets would create a wealth effect that would stimulate consumption and growth, but it also encouraged the speculative “greater fool” mentality to take hold, in which people would knowingly buy overvalued assets in the belief that some greater fool would buy them at higher prices. But market fundamentals eventually reassert themselves, and the market crashes.

The markets then boomed before crashing in 2001, only for Greenspan and (later) Bernanke to repeat the process to produce both another stock market boom and a housing boom, both of which crashed in 2007–08. Bernanke then stoked up the biggest booms in asset markets generally, including commodities, stocks, housing, and junk and government bonds.

As Dan Thornton (2016) has pointed out, repeatedly doing the same thing and expecting a different result the next time is literally insane. The “everything bubble” is the biggest monetary experiment ever, so why wouldn’t it also lead to the biggest ever collapse? It appears that the Fed has set up the market for a fall.

¹Short-term interest rates were more volatile, however, and indeed the system was prone to short-term spikes and a series of crises. However, these problems were due to the legal restrictions on the National Banking System and not to the gold standard per se. Canada and the United Kingdom were also on the gold standard and did not experience such problems during this period.

Zero Interest Rate Policy (ZIRP)

One of the Fed's main responses to the Global Financial Crisis was to push interest rates to almost zero. The federal funds rate was lowered from 5.25 percent in August 2007 to near zero by December 2008 and has not changed much since. ZIRP has a number of adverse effects, however.

First, it encourages investors to take more risks to boost yields (see, e.g., Thornton 2016). Investors are pushed out of safe fixed-income positions into riskier positions such as stocks, real estate, commodities, and structured products, which are often not appropriate for them and whose true risks are not apparent because risk spreads are suppressed as well.

Second, it encourages more borrowing and higher leverage. Many companies have used low interest rates to load up on debt they don't need to reinvest in equity markets via M&A or share buybacks in attempts to push up share prices further. As Soc Gen's Andrew Laphorne recently noted, "The effect on U.S. nonfinancial balance sheets is now starting to look devastating."² Low interest rates also delay restructuring, by allowing zombies that would otherwise fail to continue in operation, and encourage greater fiscal profligacy.

Third, low interest rates reduce financial returns, which puts pressure on savers by making it more difficult to reach their savings targets. To illustrate, if ZIRP were implemented for a decade and succeeded in pulling down returns on saving from 3 percent to zero over that period, then the value of the fund would be 26 percent lower by the end of that decade than it would have been. To indicate the scale of losses involved, OECD data suggest U.S. pension fund assets in 2009 were about \$14.42 trillion, so a decade of ZIRP would imply \$2.54 trillion in accumulated lost returns—and this figure ignores the losses on assets acquired in the interim, which could be another trillion.³ These numbers also ignore losses to other forms of

²Quoted in Elliott (2016).

³A caveat is that, depending on their asset allocation strategies, pension funds might benefit from ZIRP or QE-induced capital gains on their investments. For conservative funds that invest mainly in bonds, however, these gains will be much less than the losses indicated in the text. On the other hand, people who put their entire pension fund in the stock market would have done well. Such considerations reinforce the point that ZIRP and QE arbitrarily redistribute from safe investors to those willing to take big risks.

saving, which might easily be another one and a half trillion.⁴ The law of compound interest implies that sustained ultra-low interest rates have a devastating impact on savers and pension funds.

The conventional wisdom is that the lower the interest rate the greater the stimulus to credit. The level of interest rates is a key profit driver for all banks, however, and the lower the interest rate the lower banks' profitability from their main lines of business (e.g., spreads/carry, fees, liquidity, and trading). To quote a recent Fed study: "Empirical analysis shows that low rates are contributing to weaker NIMs [net interest margins] and identifies an adverse effect that is materially larger when interest rates are low. It suggests that these effects can be material for banks in some key advanced foreign economies" (Claessens, Coleman, and Donnelly 2016).

ZIRP intensifies these profit-reduction effects. Banks' profitability is further reduced when the yield curve becomes flat or inverted, as it now is in Japan. The flatter or more inverted the curve, the less profitable is banks' traditional core business of borrowing short term to lend long term.⁵

ZIRP also discourages bank lending; there is little profit from lending, so the supply of loans falls. We then see the drying up of interbank lending, as there is little return to it. Meanwhile, the alternative of holding excess reserves on deposit at the Fed is all the more attractive when the Fed pays interest on those reserves set at the maximum of the Fed's target range for the fed funds rate. In addition, the adoption of ZIRP was followed by a major fall in bank lending generally—it took more than five years for bank lending in real terms to return to precrisis levels—and the contraction was especially hard on small and medium enterprises. ZIRP thus intensified the credit crunch rather than alleviated it.⁶

ZIRP has also failed to boost spending by reducing saving. The personal savings rate has gone up from 3 percent at the start of 2007 to

⁴Barrington (2014) offers an analysis that suggests that depositors alone lost \$784 billion in income over the five years of low interest rates, which number would extrapolate to more than \$1.5 trillion over a decade.

⁵For further empirical evidence that lower interest rates lead to lower NIMs, see, e.g., the chart in Wheelock (2016).

⁶Sources: (a) Commercial and Industrial Loans, All Commercial Banks [BUSLOANS], (b) Bureau of Labor Statistics, Consumer Price Index for All Urban Consumers: All Items [CPIAUCSL]. Both retrieved from FRED, November 6, 2016.

about 5.6 percent according to latest figures.⁷ The conventional view that a lower interest rate will reduce saving is wrong. The explanation is that individuals have future savings targets (e.g., pension income targets)—because ultra-low interest rates have made it much more difficult for them to meet these targets, they respond by saving more, even though the returns are lower. The behavior of saving since the financial crisis provides another illustration of how little mainstream economists understand how the economy works, especially at ultra-low rates.

Putting these points together, it is clear that the major central banks have fallen into a ZIRP trap. They implement ZIRP in the mistaken belief that it will stimulate the economy and/or boost inflation. However, ZIRP does not stimulate and central banks continue with ZIRP (or worse, negative interest rate policy [NIRP]) in self-defeating attempts to produce a stimulus that ZIRP cannot produce. They are then doomed to remain stuck in this trap until they realize their error and see the way out—and there is no sign of that happening anytime soon.

Quantitative Easing (QE)

A second pillar of unconventional monetary policy is large-scale asset purchases, known as quantitative easing. When the program unofficially started, on November 25, 2008, the Fed held \$490 billion worth of securities, all of which were Treasury obligations. When the program ended in October 2014, its holdings had risen to \$4.3 trillion, comprising \$2.5 trillion in Treasuries and \$1.8 trillion in mortgage-backed securities (MBS). The stated purpose of the program was to reduce long-term yields to encourage investment and spending, and so boost output and employment.⁸

⁷Source: U.S. Bureau of Economic Analysis, Personal Saving Rate [PSAVERT], retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/PSAVERT>, October 8, 2016.

⁸As Thornton (2015: 36) points out in a devastating critique, “It is disconcerting that QE’s theoretical foundations evolved well after the basic structure of the program was finalized [and] were, in fact, *ex post* rationalizations. What’s worse is that those rationalizations were extraordinarily weak.” He also points out that they are based on a discredited theory of the term structure and are empirically falsified. Moreover, “there is virtually no credible evidence that QE led to persistent reductions in long-term yields via the channels identified by the Fed. The fact that QE was not accompanied by any substantial increase in bank lending further undermines the possibility that it stimulated economic activity” (*ibid.*, p. 1). See also Thornton (2017).

QE was accompanied by the payment of interest on excess reserves (IOER), intended to neutralize the flood of excess reserves that QE was creating. This combination of QE and IOER is best understood not as monetary policy per se but as preferential credit allocation policy. Such a policy, as Lawrence H. White (2015: 17) notes, is a bad idea: it is “overreaching, wasteful, morally hazardous, and fraught with serious governance problems.” White (2016: 360–61) explains further:

Credit allocation policy is a kind of central planning in which Federal Reserve officials, risking not their own money but that of taxpayers, substitute their judgment for [that of financial market participants]. . . . When the Fed directs a larger share of credit to one favored sector (like housing), more promising sectors get smaller shares, a waste of scarce loanable funds on lower-payoff investments. Fed-directed allocation of funds to a declining industry throws good resources after bad. An increase in political credit allocation reduces economic growth not only by creating deadweight loss . . . , but by incentivizing socially unproductive lobbying efforts to be among the favored credit recipients. Especially if the Fed allocates funds to rescuing particular firms, it creates tremendous moral hazard and an environment ripe for cronyism.

Targeted assistance is, however, a form of fiscal policy; and such decisions properly belong to Congress.

All this buying achieved little benefit, except to Wall Street who naturally loved it. The impact of QE was well described three years ago by Andrew Huszar, a former Fed official in charge of implementing QE1:

Even by the Fed’s sunniest calculations, aggressive QE over five years has generated only a few percentage points of U.S. growth. By contrast, experts outside the Fed, such as Mohammed El Erian . . . suggest that the Fed may have created and spent over \$4 trillion for a total return of as little as 0.25 percent of GDP (i.e., a mere \$40 billion bump in U.S. economic output). Both of those estimates indicate that QE isn’t really working. . . . The central bank continues to spin QE as a tool for helping Main Street. But I’ve come to recognize the program for what it really is: the greatest backdoor Wall Street bailout of all time [Huszar 2013].

The Failure of Stimulus

The failure of Fed policies to stimulate the economy is apparent from a range of performance indicators. Some were highlighted in a recent study by Porter et al. (2016):

- A long-term slowdown in the economic growth rate, which is lower than at any time since the late 1940s and was only 1.6 percent through the recent recovery.
- Job creation has fallen from an historical average of 2.1 percent until the early noughties down to about 0.5 percent now, and since 1990 there has been negligible growth in U.S. jobs exposed to international competition.
- Labor force participation has declined from a high of nearly 78 percent in 1997 to about 73 percent.
- Real income is stagnant or declining, and median real income is well below the peak it attained in 1990.
- Inequality is rising, and the Fed has contributed to rising inequality in so far as its policies have redistributed from the poor and savers to Wall Street types and high-net-worth investors.
- A slowdown in small business formation: startups have fallen from 11 percent of all firms in 2006 to just over 8 percent, and small companies are no longer the leading job creator.

To these we might add other indicators of economic distress: the U6 unemployment rate is 9.7 percent, almost double the official unemployment rate of 4.9 percent; 34 percent of Americans don't have a dime and 69 percent have less than \$1,000 in their bank accounts; 65 percent of all children in the United States live in families that get federal aid; and 46 million Americans use food banks.

The most worrying performance indicator of all is the collapse of productivity growth. Between 1947 and 1973, labor productivity rose at an annual rate of 3 percent. In the subsequent period to 2010, it fell to 1.9 percent per annum—a fall that can possibly be attributed to the growth in business regulation (Hutchinson 2016)—and it has since plunged to 0.5 percent. Outside the United States, annual productivity growth in the United Kingdom averaged 2.2 percent from 1959 to 2007 but has since collapsed to 0.1 percent. In the eurozone, it declined from 1.3 percent between 1995 and 2007 to 0.7 percent

since. In Japan, manufacturing productivity growth was 2.5 percent over 1990–2008 but has been minus 1.2 percent since then.⁹

Conversely, the productivity slowdown is far less in emerging markets, where interest rates have been kept at more normal levels. According to the Conference Board's Total Economy Database, annual productivity growth in major emerging economies (Brazil, Russia, India, China, South Africa, Mexico, Indonesia, and Turkey), which averaged 4.9 percent in 1999–2006, has slowed only slightly to 4.2 percent in 2007–15 although there are signs of a further slowdown since 2013.

The correlation between extreme monetary policies and lousy productivity figures is therefore unmistakable. We can now write a new economic law, validated in four separate experiments, that, if you maintain ultra-low interest rates for an extended period of time, you will eventually get a collapse in productivity growth.

The most popular explanation—Robert Gordon's theory (Gordon 2016) that technological advances are becoming more trivial so productivity growth is declining long term—doesn't fit the timescale. The disappearance of productivity growth has happened too quickly to be the result of technological senescence, and in any case technological change itself seems to be continuing at a brisk clip.

The explanation is that pushing interest rates well below their natural levels for a prolonged period distorts firms' investment and financing decisions and crowds out investments that boost labor productivity. It encourages firms to borrow money to spend on buy-backs, debt refinancing, and dividends; it promotes speculation in financial, commodity, and real estate markets, especially when investors believe that central banks will support these markets; it encourages investments in large otherwise unviable projects; and it encourages cash hoarding. At the same time, it discourages business investments such as investments in new plants, R&D, and worker training that would boost labor productivity.¹⁰

⁹Sources: Bureau of Labor Statistics: Nonfarm labor productivity; U.K. Office for National Statistics: Productivity Measures; Eurostat: Labor productivity; and Japan Productivity Center: Manufacturing Productivity.

¹⁰BEA figures for net nonresidential fixed investment show a big fall after 2008, and it took five years for it to recover to no more than a little over its 2008 value. Since these numbers include the unviable big projects mentioned in the text, it is clear that labor-productivity-supporting investment has fallen greatly. Source: Bureau of Economic Analysis, Real Private Nonresidential Fixed Investment [PNFIC96], retrieved from FRED, November 5, 2016.

And what is the response from the world's leading central bankers? A little modesty, perhaps? Not a bit. To cite Mario Draghi, in remarks made on April 21, 2016, there is little alternative to the ECB's course of money printing and low interest rates in a world where economic prospects are dim.¹¹ Yet we have been awash with vast stimulus programs for nearly a decade and now find ourselves in a world of poor prospects despite all that effort.¹²

Unsustainability of Unconventional Monetary Policies

Unconventional policies have not just failed; they are not sustainable either. Part of the reason is that central banks cannot eliminate risks; instead, they can only suppress them temporarily at the cost of making the eventual crisis worse. As Bloomberg's Richard Breslow observes:

A portfolio built to only withstand stress thanks to central bank intervention is one destined to blow-up spectacularly. The embedded flaw . . . is that central banks give investors perfect foresight. And nothing can go wrong. . . . You don't need to be a Taleb or Mandelbrot to calculate that we have been having once in a hundred year events on a regular basis for the last thirty years [quoted in Durden 2016a].

Historical experience suggests that risks are actually greatest when measured risks—such as risk spreads and volatilities—are at their lowest and people start wondering where all the risks have gone.

There are additional reasons to think that current policies cannot go on indefinitely and policymakers are now holding a tiger by the tail. Many informed observers have been warning for years that the build up of debt is unsustainable. If one thinks about a crisis as a

¹¹Cited in Karanyi and O'Donnell (2016).

¹²We do not have space to discuss the impact of the uncertainty the Fed has generated. As Dorn (2015) points out, "The path of monetary policy is based on pure discretion and is data dependent; there is no monetary rule to guide policy. Forward guidance has not worked to calm markets, and Fed watching has become obsessive." Nor have we discussed the intractable lack-of-knowledge and incentive problems facing central banks. For more on these important subjects, see Thornton (2015), White (2012), and O'Driscoll (2016a, 2017).

period of deleveraging, there has been no deleveraging since 2007. Indeed, a recent IMF report (IMF 2016) states that current debt levels are a record 225 percent of world GDP, well up on 2007. These create a headwind against global recovery, pose a major risk to financial stability, and imply that macroeconomic policymakers have run out of ammo to counter a renewed downturn. Come the next recession, it will become obvious that many of these debts cannot be repaid and we will be looking at debt forgiveness or defaults on a large scale.

No Exit?

If current monetary policy is unsustainable, it is not clear how the Fed could restore monetary normality. There may be no safe exit either, and the Fed may have trapped itself in a QE-forever cycle. An exit strategy requires that the Fed raise interest rates to normal levels, but the mechanics of raising interest rates are far from straightforward.

Prior to the financial crisis, the Fed would raise its target fed funds rate and use open-market operations to keep interest rates within their target range. However, the Fed's response to the crisis has led to a situation where the fed funds market has become largely irrelevant. For example, the Fed could use interest on reserves and reverse repurchase agreements as an offer to borrow back Federal Reserve deposits at its desired rate, and this offer would put a floor under the fed funds rate. When the Fed raises its offer rate, the fed funds rate should go up with it, and the success of the Fed's operation to raise the target fed funds range from 0–0.25 percent to 0.25–0.5 percent in December 2015 demonstrates that the mechanism works. Unfortunately, the fed funds market is now largely disconnected from other markets, and market yields fell after the December rate rise. The Fed thus lacks reliable instruments to influence interest rates generally. If inflation expectations were to rise, which is likely, then market interest rates would likely rise and the Fed would have difficulty reasserting control over them.¹³

¹³Jordan (2016, 2017) and O'Driscoll (2017) provide powerful analyses of these important issues.

To quote O'Driscoll (2016b), “The misalignment between market expectations and Fed capabilities is very dangerous, and I fear it will not end well.”

Even if the Fed could raise rates, there is also the problem of how to raise them without triggering a crisis.¹⁴ A rise in interest rates would increase financing costs and the cost of debt service, and impose a major strain on highly leveraged companies and individuals, many of whom would be bankrupted. Higher interest would also put financial pressure on governments and could prompt bankruptcies at municipal or even state level.

Higher interest rates would inflict enormous losses, too. Fed policies have pushed investors into the long end of the curve in their search for yield, but low interest rates and longer maturity imply greater duration and greater exposure. To give an idea of possible losses, a recent Goldman article quoted in Durden (2016b) suggested that a 100-basis points rise in interest rates might produce a loss close to \$1 trillion or about 5 percent of U.S. GDP.¹⁵ A rise to normal interest rates would suggest losses of \$3 trillion to \$4 trillion and other estimates

¹⁴In comparison, the task of reducing the Fed's balance sheet is easier, e.g., it could allow assets to mature without rolling them over. Reducing the Fed's balance sheet is highly desirable because it would remove the distortions in asset prices and credit allocation created by its current bloated balance sheet. Our best guess, however, is that, as the Fed gradually realizes that it does not *have* to reduce its balance sheet, it will renege on its promises to reduce it to precrisis levels: “The FOMC will continue to distort markets until, by some as-yet-unknown magic, those markets return to normal” (Thornton 2015: 25). It will then increasingly see its balance sheet as a useful way to target assistance to particular economic sectors or asset classes, as and when it deems such assistance to be necessary. The size and composition of its balance sheet will then be promoted as additional policy tools, and the Fed will argue that its balance sheet-to-GDP ratio is actually quite low relative to other major central banks. Come the next crisis, the Fed would further ratchet up its balance sheet and soon be looking at a Japan-style scenario, of which more below.

¹⁵The math is easily verified using the back-of-the-envelope modified duration formula, i.e., the loss is approximately notional exposure times modified duration times the change in basis points. With a modified duration of 5.6 and an exposure of \$17 trillion, then a 100-basis point increase in interest rates would lead to a loss of \$950 billion.

are considerably higher.¹⁶ And these are only the losses to bondholders.¹⁷

Financial markets are now highly correlated—one might even say that the only asset that now matters is the 10-year Treasury note. A sharp rise in interest rates would then have major adverse effects on other asset markets, and all the asset price bubbles that the Fed has blown since the crisis would likely burst. Large pools of institutional capital have also become accustomed to strategies based on short-term returns and relative performance. Such strategies produce steady returns and the appearance of low risk but leave investors highly exposed to a major market move and prime the markets for a black swan event. As hedge fund manager Mark Spitznagel notes, “All assets are very much correlated. I think there is just one big bet out there, so diversification isn’t going to work.” With “low rates and high stock valuations [markets] are extraordinarily sensitive to changes in rates.” Any significant increase in rates could cause markets to “go down very, very hard” (quoted in Durden 2016c).

Many of these exposures are also poorly hedged. Leaving aside that many market participants have never experienced a hike in interest rates, it is difficult to design a hedging strategy against interest-rate risk because interest rates have been so stable—that is, they don’t have the data to calibrate a hedge. Risk models are difficult to calibrate for the same reason, making them useless when it comes to anticipating the consequences of the out-of-sample events that matter. Indeed, risk models would make market instability worse. Should any event trigger major losses, model-based risk management strategies would respond by sell-offs to get the risk numbers back down,

¹⁶The same article also suggested that the total face value of all U.S. bonds might be as high as \$40 trillion, in which case the loss from a 100-basis points rise would be well over \$2 trillion. Whitehouse (2015) suggests that the same rise in interest rates might produce a loss of \$3 trillion. One would also get bigger losses with higher duration numbers, and an anonymous post on the *Wall Street Journal* website suggested that Treasuries might have an average modified duration as high as 7.79.

¹⁷Higher interest rates would also inflict major capital losses on the Fed itself. Torres, Zumbrun, and Gage (2013) suggested that it could face losses of half a trillion dollars, and one can easily carry out duration analyses that produce even bigger numbers. Losses on this scale would more than wipe out the Fed’s \$40.2 billion capital and render it insolvent on paper. They would also trigger awkward questions from Congress, but doubtless the Fed would just tough it out—negative capital does not hinder a central bank’s ability to function because it can always print more money.

and these would create a positive-feedback loop that could greatly intensify a market downturn. In addition, most Wall Street risk models are still using Gaussian assumptions and back-calculating volatility based on recent data. As set out in our book *Alchemists of Loss* (Dowd and Hutchinson 2010), this will provide a double whammy in a crisis, of volatility being much higher than that assumed and securities moving by amounts far greater than suggested by Gaussian models, even plugging in the higher new volatility.

If we add to these considerations that market liquidity is fragile, interconnections are not well understood, and many risks have migrated outside the regulated perimeter, it is abundantly clear that any attempt to restore interest rates to normal levels could have awkward repercussions.

Bear in mind the recent bond market “tantrums” in which the adverse market reactions to modest tightening or even rumors of such led central banks to postpone further attempts for fear of provoking sell-offs, and the scale of the practical difficulties it faces is all too clear.

The Fed is then boxed in. It needs to raise interest rates to restore monetary normality but can’t feasibly do so, and the longer it delays the worse the underlying misallocation and risk exposure problems become. In the meantime, the choice remains what it always was—a bad downturn now or worse later—and the clock is ticking.

Ramping-Up QE

The danger is that the Fed would respond as it usually does by reaching out for additional policy instruments that it has not yet tried. Each of these has the potential to create unprecedented mischief, monetary and otherwise.

The first is to ramp-up QE, but this experiment has already been tried big time in Japan and failed. Indeed, Japan entered the financial crisis with an already bloated central bank balance sheet roughly as big relative to GDP as the Fed’s is today. It has since risen to 90.5 percent of GDP, having nearly tripled in less than three years.

This enormous stimulus achieved little beneficial effect—unemployment fell a little, but growth was negligible. To state the obvious: if QE on this scale didn’t work in Japan, there is no reason to think it would work anywhere else.

It did, however, have a number of adverse effects. Leaving aside plummeting productivity, a greatly expanded central bank balance

sheet greatly expands the problems of arbitrary redistribution, misallocation, and the undermining of market processes that are inherent in QE. Consider two examples.

The BOJ's bond purchases are on such a scale that it has cornered the market and is struggling to find further bonds to buy. These purchases distort interest rates across the yield curve and mean that Japanese financial institutions are increasingly assessing bonds on the basis of their likelihood of being bought by the BOJ rather than on the basis of the creditworthiness of their issuers. Bond prices don't matter either: even if bonds promise subzero yields, financial institutions will still buy them because they can be confident of selling them on to the BOJ at higher prices.

The BOJ, aka the Tokyo Whale, is a top 10 shareholder in 90 percent of Nikkei 225 stocks and is well on the way to becoming the biggest shareholder in the country—it is gradually nationalizing the stock market. “For those who want shares to go up at any cost, it's absolutely fantastic that the BOJ is buying so much,” said Shingo Ide, chief strategist for the NLI Research Institute in Tokyo. “This is clearly distorting the sanity of the stock market” (quoted in Nakamura, Kitanaka, and Sano 2016). Stock prices are supposed to reflect the underlying value of a company and to be priced correctly; equities should reflect earnings and other fundamentals, not the whims of central bankers on a buying binge. Instead, the market is becoming detached from fundamentals and the BOJ is creating an enormous bubble.

The knock-on effects in both stock and bond markets include the promotion of a greater fool mentality, the undermining of price discovery and market liquidity, the undercutting of efforts to make public companies more efficient, and doubts about the BOJ's ability as top stakeholder to hold corporate governance to account. If these policies continue, then it is only a matter of time before the BOJ owns the entire market.

An additional worry is that even a small sell-off could scare investors and provoke a flight from the yen. In fact, the BOJ didn't even achieve its own monetary policy objectives of boosting inflation and pushing down the yen. Instead, inflation fell and the yen strengthened. The latter would appear to be in a bubble too.

Despite these failures, Japanese monetary policymakers remain fixated on stimulus. Their latest policy shift is to peg Japanese government 10-year bond yields at zero, giving up any attempt to control

the size of their own balance sheet and throwing monetary control out of the window. As for the government's enormous (about 250 percent) debt-to-GDP ratio, Keynesian commentators are now suggesting that the central bank should buy up government debt and write it off—that is, provide government with a “helicopter drop.” We will come back to this proposal a little later, but either of these policies paves the way for the unlimited expansion of the BOJ's balance sheet, and we all know how that would end. The last remaining constraints against the overissue of base money are being kicked away as Japanese policymakers become increasingly delusional.

Negative Interest Rate Policy (NIRP)

The second proposal is NIRP, and the argument usually made is that NIRP would stimulate the economy by encouraging people to spend instead of save. This argument, however, fails to learn from ZIRP's failure to stimulate. That it might not be the best of ideas is suggested by NIRP's having had no precedent in 5,000 years of recorded history and having been badly received where it has been tried in Europe and Japan (Freeman 2016).

NIRP means that you get paid to borrow and you pay to lend. But if I have to pay to lend, why would I lend at all? NIRP encourages investors to flee from their traditional safe haven, bonds, into cash or into nonfinancial assets. That is the main reason why NIRPers want to abolish cash. NIRP also creates an incentive to make payments quickly and collect them slowly, so, e.g., you rush to pay your taxes but the government doesn't want you to, and one can envisage that NIRP would create an “epochal outburst of socially unproductive—even if privately beneficial—financial innovation” along such lines (Garbade and McAndrews 2012). Another example of the weirdness of NIRP was highlighted by Richard Rahn (2016): “If government can borrow at negative or close to zero interest rates and endlessly roll over their debts, it makes no sense to tax [rather than borrow].” To implement NIRP is to enter a bizarre twilight zone in which nothing works as it should. The NIRPers have not even begun to think it through.

If NIRP were implemented, would it lead people to spend more, as intended? We doubt it. Preliminary evidence suggests that NIRP in other countries is failing to encourage more spending (Kantchev, Whittall, and Inada 2016). Instead, people tend to save more to meet

their pension targets and because NIRP undermines their confidence. Even if people were to spend more in the short term, it is still difficult to see how a sustained policy of taxing bank reserves or deposits, which is what NIRP would do, could stimulate spending. Moreover, it is NIRP's anti-stimulative nature that explains why its adoption in Japan led to a stronger yen and lower inflation. The evidence from overseas also indicates that NIRP has hammered bank stocks, undermining banks' ability to lend and again producing an effect that is anything but stimulative.

What about the impact of NIRP on inflation, expected inflation, and expected real interest rates? Leave aside that no one knows much about the interconnection between these variables in a ZIRP or (especially) NIRP world, and there is another problem—such a policy is trying to reduce expected real interest rates, which are already too low and probably negative. Low/negative real returns are a disincentive to capital accumulation, however, and pursued long-term would have profoundly destructive effects on the capital stock. Or do NIRPers instead intend that the inflation rate should fall from current positive levels down to levels *sufficiently below* their proposed negative interest rates to make expected real returns high enough to encourage resumed capital accumulation? If so, how do they propose to make the switchover to positive real rates, and what about their current inflation targeting mandates?

Negative interest rates would also have serious adverse effects on the financial system. As Chris Whalen (2016) recently pointed out,

Negative numbers do not exist in the natural world . . . only in the theoretical realm inhabited by economists. Negative interest rates are deleterious to the well-being of financial institutions, commercial enterprises and consumers. Negative interest rates suggest liquidation, destroy the capital stock and ultimately cause a shrinkage in the amount of credit.

We would go further: sustained NIRP would destroy the financial system. It would make banks' core business model unviable, especially where the yield curve becomes inverted. However strong they might currently be, NIRP would turn banks into loss-making entities that must eventually fail. Defined-benefit pension schemes would also become unviable, as negative returns would mean that they could not meet their long-term commitments. Asset managers, hedge funds, and even insurance companies would become unviable too.

At the most fundamental level, negative interest rates are a dreadful idea because they penalize thrift and reward impetuosity. They are the epitome of institutionalized short-termism, in which we are encouraged to “live for today” when any reasonable person can see that we shouldn’t. There is a reason why historical interest rates have always been positive, and it is called time preference. Negative interest rates are an offence against the law of time preference, and to mess with that is to unleash a monetary pandemonium the adverse consequences of which we have barely begun to appreciate.

To NIRPers, however, the zero lower bound is not a boundary but an obstacle to be kicked aside so omniscient central bankers can ramp up their monetary experiments in a misguided effort to gamble their way out of the consequences of their previous mistakes.

Banning Cash

Let us suppose, nonetheless, that the monetary authorities decide on NIRP. They then run into a constraint: if central banks push interest rates too far into negative territory, bank depositors and bond investors would switch into cash to obtain a zero return instead.¹⁸ A serious effort at NIRP therefore needs to be enabled by blocking this escape route—that is, by abolishing cash. Central bankers could then impose whatever negative interest rates they wish, and we would all have to put up with it.

However, those who would ban cash usually ignore the substantial costs that proposal entails. An example is the impact on the extreme poor. According to a recent study by Shaefer and Edin (2012), in 2011 there were over 4 million people in the United States who live on less than two dollars a day. These include the indigent and many who are poorly educated and mentally ill—that is, the most vulnerable, who are completely dependent on the cash economy. There are

¹⁸Strictly speaking, the decision whether to keep deposits in the bank or withdraw them as cash depends on the carry costs of currency and on the nonpecuniary benefits of deposits versus cash. The former potentially include the costs of storage, safekeeping, handling, and transportation; and the latter include the benefits of direct access to the electronic payments system. So ignoring differences in carry costs for the sake of illustration, bank deposits have the advantage over cash that they can be directly used for electronic payments systems, whereas cash cannot. The upshot is that most people would be willing to accept a small negative interest rate on their deposits before converting to cash, but as interest rates fall further, people will definitely convert to cash.

also those who have chosen to hold much of their wealth in the form of cash, including many foreigners, for whom holdings of U.S. dollars are a protection against financial repression in their own countries. Banning cash would expropriate much or all of their wealth.

Banning cash has wider implications, too. Once people are forced to rely solely on digital bank currency, then all transactions would be monitored and only those of which the state approves would be permitted. The state would then acquire much greater control over everyone's lives. All financial holdings would be vulnerable to government predation, and the state would have the ultimate means of control. Any remaining citizens' rights to financial privacy—surely, a basic human right—would be destroyed. With no other access to their money, anyone targeted by the state couldn't hide, couldn't resist, and couldn't escape. The loss of financial privacy implies a huge loss of civil liberties.

Moreover, once such powers are conceded to the state, it is unreasonable not to expect proposals to use that power to achieve other supposedly useful objectives. Indeed, one of the other reasons put forward for abolishing cash is to make life difficult for "bad guys" such as drug dealers. The suppression of cash then becomes a weapon in the war against drugs, terror, tax evasion, and so on.¹⁹

We would suggest more targeted approaches to such issues. In the case of drugs, we might reconsider prohibition; in the case of terrorism, we might reconsider security and foreign policies; and, in the case of tax evasion, we might consider tax reform. It is surely simplistic to argue that, just because bad guys use cash, we should ban it for everyone. By that logic, every single amenity that we use should be banned because bad guys use them, too.

¹⁹Those who would ban cash also make the implicit assumption that cash is the vehicle of choice for the bad guys, but it is not. A recent U.K. government report suggested that banks and accounting firms pose the highest risks of facilitating illicit transactions. To point out the obvious: (1) these are regulated already, so the problem is really regulatory failure rather than the availability of cash, and (2) the ban-cash logic would then suggest that it would make more sense to ban these than to ban cash. That same report also suggested that the costs of this criminal activity were £24 billion, which is not much more than 1 percent of GDP. Thus, the losses involved are fairly small and could be reversed by sensible tax reforms, but these are not on the agenda.

Forcing everyone to use state-controlled digital currency also makes it much easier for the state to pursue sado-economic policies in which it punishes anyone it does not like—savers, rentiers, and dissidents are obvious targets. There is, too, the danger that the control apparatus would be hijacked by some group with a control agenda, e.g., “health fascists.” Too much tobacco, alcohol, sugar, carbs, etc. are bad for our health; so why not use the state’s power to control how much we spend on these items? Everyone then ends up on a state-controlled diet prescribed by whoever the state declares knows best.

Printing Money

The last throw of the dice is to “print money”—a one-off increase or a series of increases in the supply of base money. One variant is to monetize government debt. Proponents suggest that the Fed has done lots of QE and inflation is still low, so why not go all the way and use QE to buy up the rest of the publicly held government debt? Since Treasury debt held by the public is about 80 percent of GDP, such a policy would produce a massive increase in the amount of money held by the public. Unless one believes that all of the newly issued base money would end up as excess reserves in the banking system, one must suppose that most/all of the newly issued base money would end up as currency in circulation, implying that the latter would increase about tenfold. There would then be a big increase in spending and prices would rise; interest rates would lift and encourage existing excess reserves to flood out of the banking system and further boost the currency in circulation. There would then be a period of sharp inflation, and prices would rise by at least tenfold. Whether they subsequently stabilized or continued to rise would depend on whether the debt monetization policy was a one-off or not.

The ultimate way to print money is via a helicopter drop—the central bank issues base money and gives it away to the public or uses it to finance pet projects. Helicopter money is a bad policy for at least three reasons.

It fosters the illusion of a “free lunch,” which distracts policymakers from the more difficult but necessary issues—such as the need for structural, fiscal, and monetary reforms. Rational policy is impossible in a world in which policymakers operate under such an illusion.

Another problem is that helicopter money intrudes on decisions that are fiscal in nature. Bundesbank President Jens Weidmann made this point in a recent interview:

The question of whether and how money is given away to the general public is a highly political one that would need to be addressed by governments and parliaments. Central banks don't have a mandate to do so, not least because it would mean redistributing assets on a huge scale. It would be nothing short of unreservedly commingling monetary and fiscal policy, a step which would be incompatible with the notion of central bank independence [Weidmann 2016].

These considerations lead to the third and biggest problem with helicopter money, namely, that it threatens to destroy altogether any last remaining constraints against the overissue of base money. If helicopter money is tried and is perceived to have been a success, there will be pressure to repeat the operation; if it fails, there will be calls to escalate the program because it wasn't tried on a big enough scale.

A powerful constituency will have been created that benefits from "free" money. This constituency encompasses not only Congress but all the special interest groups that might lobby Congress—that is, everyone who might want "free" money. There will then be enormous pressure on the Fed to expand the program, and there is potentially no limit to the demand for such finance: the supply of (supposedly) worthwhile projects to be financed at (supposedly) zero cost is infinite.

Instead, we should listen to the advice of the German hard-money economists. As Weidmann (2016) points out,

Instead of raising the prospect of ever more daredevil feats [on the part of monetary policy], it would actually be wise to pause for thought. Monetary policy isn't a panacea—it can't replace urgently needed reforms in individual countries, nor can it solve Europe's growth problems. That would simply be too much of a tall order, and it would most certainly end in tears.

Otmar Issing (2016) is even more scathing: Helicopter money "is nothing less than a monetary policy declaration of bankruptcy. A central bank that is throwing out money for free will hardly be able to regain control of the printing press."

We can also imagine a truly dystopian monetary future in which these policies are implemented jointly. The central bank engages in massive QE and buys everything up. Cash is banned, and there is no longer any financial privacy. NIRP is implemented, and returns go negative. The major financial institutions—banks, insurance companies, hedge funds, and pension funds—are bankrupted. The banks are taken over as government-run utilities, and old-age provision becomes a state monopoly. A deflationary spiral is avoided by large-scale money printing. If private accumulation of capital is falling, print helicopter money to finance publicly owned investment funds. Want more infrastructure? Have a pet project? Want to eliminate public debt? Print more money. Fiscal and monetary policy is then driven by the illusion that helicopter money is “free,” and it becomes the dominant policy instrument. All constraints to protect sensible finance and sound money go out of the window, and the value of the currency goes to its intrinsic commodity value, nothing.

Conclusion: Bad Monetary Ideas Lead to Bad Monetary Outcomes

There is no idea so preposterous that some monetary economist somewhere won't seize upon it as a panacea. Run it through some central bank research department, and it emerges as a “serious” policy proposal. Have it proposed by some central bank governor, and it becomes the preferred solution. QE, ZIRP, NIRP, banning cash, and helicopter money are all examples. These are all bad ideas that cannot but lead to bad outcomes. This orgy of irresponsible monetary experimentation cannot last, and the endgame will not be pleasant.

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